

Fabrication of Silicon Master Using Dry and Wet Etching for Optical Waveguide by Thermal Embossing Technique

Jung-Hun Kim, Yu-Min Jung¹, Yu-Jeong Cho¹, Jong-Wan Kim²,
Yeong-Cheol Kim, Hwa-Il Seo*, Kyung-Hwan Kim³ and Makoto Ishida²

School of Information Technology, Korea University of Technology and Education,
Cheonan, Chungnam, 330-708, Korea

¹Department of Materials Engineering, Korea University of Technology and Education,
Cheonan, Chungnam, 330-708, Korea

²Department of Electrical and Electronic Engineering, Toyohashi University of Technology,
Toyohashi, 441-8580, Japan

³Department of Electrical and Information Engineering, Kyungwon University, Seongnam,
Kyunggi, 461-701, Korea

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Masters for the fabrication of planar optical waveguides were fabricated from (100) silicon wafers. Deep reactive ion etching (DRIE) and wet chemical etching were used to form smooth rectangular patterns on the masters. The roughness of the etched patterns was small enough to fabricate planar optical waveguides. The treatment of a master surface with oxide and perfluoroalkylsilane (PFAS) improved further the separation of the master and the substrate. The materials that were used as underclad and core layers were organic-inorganic hybrids called as-hybrid materials (HYBRIMERS). We successfully replicated the waveguides with the fabricated masters.

*Corresponding author, e-mail address: hiseo@kut.ac.kr